

### Claims

We claim:

1. A water pressure system comprising:

a submersible pump for pumping water from a water bearing aquifer;

5 a pressure tank installed in a well casing of the water pressure system, and connected to the submersible pump with a drop pipe, the pressure tank including an inlet end, an outlet end, and an outer sidewall with an flexible diaphragm bladder located within the outer sidewall of the tank that is fillable with water from the submersible pump for storing a reserve of water; and

10 a pressure switch coupled to an air chamber of the pressure tank between the outer sidewall of the tank and the flexible bladder that is pre-charged with pressurized air for monitoring pressure in the tank and controlling operation of the submersible pump.

2. The water pressure system of claim 1 wherein the pressure tank is small enough to fit underground within the well casing of a water well.

15 3. The water pressure system of claim 2 wherein the pressure tank is approximately four inches in diameter and approximately ten feet long.

4. The water pressure system of claim 1 wherein the pressure tank can draw down approximately one to three gallons of water.

5. The water pressure system of claim 1 wherein the flexible diaphragm bladder is made of butyl rubber.

20 6. The water pressure system of claim 1 wherein the pressure tank is made of a non-corrosive sanitary material, such as plastic.

7. The water pressure system of claim 1 wherein the pressure tank is made of PVC.

8. The water pressure system of claim 1 further comprising a flow control valve connected between the submersible pump and the pressure tank for maintaining constant water pressure in the system.

5 9. The water system of claim 1 wherein the submersible pump is a variable speed pump for maintaining constant water pressure in the system.

10. A water pressure system for use with underground water wells comprising:  
a submersible pump installed in an underground well of a water pressure system;  
a first drop pipe having a first end and a second end opposite the first end, the first end  
10 connected to the submersible pump for pumping water from a water bearing aquifer;  
a flow control valve connected to the second end of the first drop pipe to maintain the  
flow of water in the system at a constant pressure;  
a pressure tank installed in a well casing of the water pressure system, and connected to  
the second end of the first drop pipe, the pressure tank including an inlet end connected to the  
15 flow control valve, an outlet end, and an outer sidewall with an flexible diaphragm bladder  
located within the outer sidewall of the tank that is fillable with water from the submersible  
pump for storing a reserve of water;  
a second drop pipe having a first end and a second end opposite the first end, with the  
first end connected to the outlet end of the pressure tank;  
20 a pitless adapter having an inlet connected to the second end of the second drop pipe, and  
an outlet connected to a discharge pipe; and

a pressure switch coupled to an air chamber of the pressure tank between the outer sidewall of the tank and the flexible bladder that is pre-charged with pressurized air for monitoring pressure in the tank and controlling operation of the submersible pump.

11 ~~12.~~ The water pressure system of claim 10 wherein the pressure tank is small enough  
5 to fit in the well casing of a water well.

12 ~~13.~~ The water pressure system of claim 12 wherein the pressure tank is approximately four inches in diameter and approximately ten feet long.

13 ~~14.~~ The water pressure system of claim 10 wherein the pressure tank can draw down approximately one to three gallons of water.

14 ~~15.~~ The water pressure system of claim 10 wherein the flexible bladder is made of butyl rubber.

16. The water pressure system of claim 10 wherein the pressure tank is made of a non-corrosive sanitary material.

17. The water pressure system of claim 16 wherein the pressure tank is made of PVC.

15 18. A water pressure system comprising:

a variable speed submersible pump installed in a water well;

a pressure tank installed in a well casing of the water pressure system, and connected to the variable speed submersible pump with a drop pipe, the pressure tank including an inlet end, an outlet end, and an outer sidewall with an flexible diaphragm bladder located within the outer

sidewall of the tank that is fillable with water from the submersible pump for storing a reserve of water; and

a pressure switch coupled to an air chamber of the pressure tank between the outer sidewall of the tank and the flexible bladder that is pre-charged with pressurized air, the pressure switch coupled to the air chamber of the pressure tank with an air line for monitoring pressure in the tank and controlling the speed of the variable speed submersible pump.

19. The water pressure system of claim 18 wherein the pressure tank is small enough to fit in the well casing of a water well.

20. The water pressure system of claim 19 wherein the pressure tank is approximately four inches in diameter and approximately ten feet long.